

### **REMARKS**

Claims 4-8 are pending in the above-identified application, and were rejected. With this Amendment, claim 4 was . Accordingly, claims 4-8 remain at issue.

#### **I. 35 U.S.C. § 103 Obviousness Rejection of Claims**

Claims 4-8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Mukainakano (U.S. Patent No. 6,150,797) in view of Mitkin et al. (U.S. Patent No. 6,403,261). Applicant respectfully traverses this rejection.

Claim 4 is directed to a battery pack including at least a battery cell and a protection circuit for shutting off overcurrent discharge to a load. The protection circuit comprises shut-off holding means and a detector for detecting voltage between an external plus terminal and the external minus terminal. Claim 4 has been amended to clarify that the load is connected to the external plus terminal and the external minus terminal. The shut-off holding means is connected between a battery cell positive terminal and an external minus terminal. The shut-off holding means comprises a resistor block of resistance larger than 1 k $\Omega$  and smaller than 200 k $\Omega$ . Abnormal discharge by shorting or connecting a low resistance between the external plus terminal and the external minus terminal of the battery pack is shut off, where the discharge shut-off is maintained by the shut-off holding means.

Mukainakano is directed to a chargeable power supply unit that includes a secondary cell 101 connected to external terminal 105 through sensing resistors 121, 123 and a switch circuit 103. (See col. 3, lines 51-55). Charge and discharge control circuit 102 detects voltage across the secondary cell 101, and comprises an over-charge detection circuit 116, an over-discharge detecting circuit 115, and an over-current detecting circuit 114. (See col. 3, lines 56-61). In an

over-discharge state, the output control circuit 117 causes the gate voltage of the FET 112 of the switch circuit to change from HIGH to LOW based on the output of the over-discharge detecting circuit 115. (See col. 4, lines 12-30). This stops the discharge. (See col. 4, lines 27-30).

The Examiner claims that load 109 in Mukainakano corresponds to the shut-off holding means. However, Applicant respectfully submits that load 109 in Mukainakano corresponds to the load in claim 4 that is connected to the external plus terminal and the external minus terminal, and thus cannot correspond to the to the shut-off holding means. Moreover, as discussed above, in Mukainakano, the output control circuit 117 shuts off the discharge based on a signal from the over-discharge detecting circuit 115. Thus, Mukainakano does not disclose or suggest shut-off holding means connected between a battery cell positive terminal and an external minus terminal where abnormal discharge by shorting or connecting a low resistance between the external plus terminal and the external minus terminal of the battery pack is shut off, and such discharge shut-off is maintained by the shut-off holding means, as required by claim 4. In addition, Mukainakano does not disclose or suggest a shut-off holding means having a resistance of larger than 1 k $\Omega$  and smaller than 200 k $\Omega$ .


Although Mitkin et al. discloses loading resistors of 5, 6 and 10 k $\Omega$ , Applicant respectfully submits that because load 109 in Mukainakano does not correspond to the to the shut-off holding means, it would not be obvious to replace the load in Mukainakano with the loading resistors of Mitkin et al. to derive claim 4, or claims 5-8 that depend from claim 4. Accordingly, Applicant respectfully requests withdrawal of this rejection.

**II. Conclusion**

In view of the above amendments and remarks, Applicant submits that all claims are clearly allowable over the cited prior art, and respectfully requests early and favorable notification to that effect.

Respectfully submitted,

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